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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,665	08/29/2001	Hajime Yamamoto	011096	4795

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EXAMINER

THORNTON, YVETTE C

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/940,665

Applicant(s)

YAMAMOTO ET AL.

Examiner

Yvette C. Thornton

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 8-19, 21, 23 and 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 20, 22, 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-848)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other _____

DETAILED ACTION

This is written in reference to application number 09/940665 filed on August 29, 2001 and published as US 2002/0150834 A1 on October 17, 2002.

Response to Amendment

1. Claims 1-25 are currently pending.
2. The amendment to the claims is sufficient to overcome the claim objections of claims 3-5 as set forth in the previous office action.
3. The amendment to the specification is sufficient to overcome the objection to the specification set forth in the previous action.

Election/Restrictions

4. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-7, 20, 22 and 24, drawn to a resist composition comprising three components, classified in class 430, subclass 270.1.
 - II. Claims 8-19, 21, 23 and 25, drawn to a resist composition comprising two components, classified in class 430, subclass 270.1.
5. The inventions are distinct, each from the other because of the following reasons:
 - a. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are two photoresist compositions comprising two different base resins. The first comprising a resin binder, a photoacid generator and a compound which has an acetal moiety and a site which is eliminated

by an acid. The second composition comprises a base resin which is a copolymer having the combination of an acetal moiety and a site eliminated by an acid in one repeating unit and a photoacid generator. A search for one binder would not readily reveal binders of the other invention. Furthermore the invention of the first invention requires an additional component, which is not required by the second invention.

b. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

6. Applicant's election of group I, claims 1-7, 20, 22 and 24 in Paper No. 06172003 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election **without** traverse (MPEP § 818.03(a)).

7. This application contains claims 8-19, 21, 23 and 25 drawn to an invention nonelected with traverse in Paper No. 06172003. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01.

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Interpretations

9. The examiner has interpreted the claims, in light of the amendment filed on December 11, 2003, to pertain to a resist composition comprising (1) a base resin; (2) a photoacid generator; and (3) a monomer compound having the combination of an acetal moiety and a site which is eliminated by an acid in its molecule.

Claim Rejections - 35 USC § 112-1st paragraph

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 1-7, 20, 22 and 24 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an additive having the combination of an acetal moiety and a site, which is eliminated by an acid in its molecule being added to the said composition, does not reasonably provide enablement for the said additive being a monomeric compound. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The specification has support for two possible inventions. One invention comprises an additive having the combination of an acetal moiety and a site, which is eliminated by an acid in its molecule (spec. ex. 1). The other invention comprises the said moiety as a repeating unit of the claimed base resin (spec. ex. 4). The examiner has found no support in the specification for an additive being a monomeric compound not attached to the claimed base resin as set forth in the presently amended claims.

12. The examiner notes that the invention exemplified in example 4 of the specification is non-elected in the present application (see paragraphs 4-8 above).

Claim Rejections - 35 USC § 112-2nd paragraph

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

14. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to the examiner how the structures presented in instant claim 3 meet the limitations of a monomeric compound as set forth in instant claim 1.

Claim Rejections - 35 USC § 102

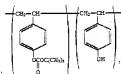
15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States

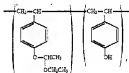
16. Claims 1-2, 4-5, 20, 22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagata et al. (US 5856561 A). Example 5 of Nagata exemplifies a resist

composition comprising polymer 1 having the structure:



; polymer

3 having the structure:



; a photoacid generator PAG1 of the



structure:

; a dissolution inhibitor and a solvent PGMEA (see table 2; c. 19).

The resist composition was then spin coated onto a silicon wafer to form a coating of 0.7 μm thick. The coating was pre-baked for 120 seconds. The film was exposed to a pattern of light by means of an excimer laser stepper model, baked at 90°C for 90 seconds and developed with an aqueous solution of TMAH to obtain a positive pattern (c. 14, l. 54-62). Nagata teaches that the taught composition is especially suitable for fine patterning with deep-UV radiation of 254 to 193 nm and electron beams (c. 9, l. 34-38).

It is the examiner's position that the polymer 1 meets the limitations of the claimed base resin and the first monomer of polymer 3 meets the limitations of the instant claims wherein $-\text{CHCH}_3-\text{OCH}_2\text{CH}_3$ meets the limitations of both an acetal moiety and a site which is eliminated by an acid.

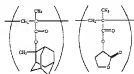
Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject

matter pertains. Patentability shall not be negated by the manner in which the invention was made

18. Claims 1-7, 20, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uetani et al. (US 6383713 B1). Example 1 of Uetani exemplifies a positive resist composition comprising a resin A of 2-methyl-2-adamantyl methacrylate and α -methacryloyl-



γ -butyrolactone represented by formula:

(synthesis ex. 1) and

an acid generator (see table 2). The said composition was spin coated on bare silicon wafer and dried. The wafers were then pre-baked, exposed with ArF excimer laser, post-exposure baked and developed to obtain an image (c. 14, l. 41-59).

Uetani teaches all the limitations of the instant claims except it fails to teach a monomer compound having a combination of an acetal moiety and a site which is eliminated by an acid in it molecule. Uetani does however teach that the resin of the taught invention may further contain other polymerization units having a group cleavable by the action of an acid. Examples include acetal type esters such as methoxymethyl ester, ethoxymethyl ester, and tetrahydrofuryl ester. Monomers used for introducing these polymerization units having a carboxylate ester in the resin maybe acrylic monomer such as methacrylic ester and acrylic ester or alicyclic monomers (c. 6, l. 18-43). One of ordinary skill in the art would have been motivated by the teachings of Uetani to incorporate a monomer having an acetal type ester into the exemplified composition of Uetani in order to introduce additional units which are acid labile. The said acetal type ester (i.e., methoxymethyl, ethoxymethyl, etc.) meets the

limitations of the instant claims wherein acetal group meets the limitations of both an acetal moiety and a site, which is eliminated by an acid.

Response to Arguments

19. Applicant's arguments with respect to claims 1-8, 20, 22 and 24 have been considered but are of little moment in view of the new ground(s) of rejection.

20. The prior art reference of Kinsho (US 6312867) teaches a dissolution inhibitor compound having both an acetal moiety and a site, which is eliminated by an acid. The said inhibitor however is not a monomeric compound as required by the amended claims.

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

22. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 571-272-

1336. The examiner can normally be reached on Monday-Thursday from 8:00 am to 6:30 pm.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff, can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Yvette Clarke Thornton
Patent Examiner
Art Unit 1752

yct
February 19, 2004